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RG:0032

Office of the Director

January 11, 1977

Mr. Hideto Kono
Director
Dept. of Planning & Economic Development
250 S. King Street
Honolulu, Hawaii 96813

Dear Mr. Kono:

INFORMATION STATEMENT
RECLASSIFICATION PETITION FROM AGRICULTURAL TO URBAN
PARTITIONS OF PROPERTY LOCATED AT
WAIKANE, KOOLAUPOKO, OAHU, HAWAII

This letter responds to your request of December 14 for our review of the above identified statement by Windward Partners in support of their petition for a land-use boundary change (A 76-423). Our response is based to a considerable extent on information accumulated by the Hawaii Environmental Simulation Laboratory in the last several years, largely through the support of the Ford Foundation and National Science Foundation. With the termination of the foundation grants last fall, most of the HESL staff has been dispersed, and our abilities to focus the information accumulated by the endeavor on the impacts of a proposal for a development within the Kaneohe region and to develop new information pertinent to such a development are seriously diminished. Our comments are therefore restricted to the natural environmental effects on the proposed urbanization in Waikane. Paul Bartram, who continues to have a HESL attachment, has contributed to the development of these comments.

1. Marine ecosystems

The Statement correctly observes that the marine ecosystem in Kaneohe Bay at the mouth of Waikane Valley is fragile. It also correctly observes that changes in this ecosystem to date cannot be entirely blamed on urbanization in Waikane because the valley is largely undeveloped. It errs, however, in lumping Kahana and Kaneohe Bays and attributing ecosystem damage in both to natural runoff and sedimentation.

It is merely a truism that natural runoff and natural sedimentation have shaped the natural ecosystems in both bays. However, to describe such natural

shaping as damage seems quite misleading. The Polynesian agricultural practices probably led to some slight decrease in low-water runoff to both Kahana and Kaneohe Bays as compared with natural conditions, and some slight increase in sedimentation rates in both bays. Post-Cook developments have led to substantial decrease in low-water runoff in both. Post-Cook agricultural developments and vegetational changes in Kahana probably led to some slight further increase in sedimentation in Kahana Bay, but with the more intense agricultural developments in the valleys tributary to Kaneohe Bay, the increase in sedimentation rate would expectably have been larger. The historic evidence indicates, however, that the major ecosystem changes in Kaneohe Bay resulted from the urban development in the valleys tributary to the southeastern part of the Bay. However, the reef slopes in the northwest lagoon have retained their high coral coverage (often more than 50 per cent). This high percentage of coral coverage is fairly rare in Hawaiian waters, is a vanishing resource in Kaneohe Bay, and, for reasons of scarcity, should be highly valued when evaluating the region.

These changes have, in the southeastern Bay, apparently result from the increase in sedimentation due to the process of urbanization, the increase in nutrient loadings resulting from the discharge of sewage effluents to the Bay from the urbanized areas, and perhaps to some slight extent the increase in flood discharges from the urbanized areas.

It is true that the northwestern part of Kaneohe Bay has not yet been greatly affected by the urbanization processes, because the valleys tributary to it, including Waikane, are as yet little urbanized. If the grading ordinance recently passed were properly enforced, the increase in sedimentation attributable to future urbanization would be considerably less than the increase that has resulted from urbanization in comparable climatic and geologic settings in the past. However, Waikane Valley has one of the highest rainfall erosion potentials on the Island of Oahu. Unless enforcement of the grading ordinance were unusually stringent, sediment loads to the Bay could be expected to be far above present rates. If the sewage effluents are diverted from the Bay, the nutrient effect of urbanization will also greatly decrease. Increases in flood discharge may be expected to result from urbanization, and floods will continue to result in coral kill and other effects on the biota of the reef flats of the Bay, but it is unclear how far these depart from natural conditions.

Nevertheless, it is expectable that the urbanization of Waikane Valley will have undesirable effects on the marine ecosystem of the northwestern part of Kaneohe Bay. Significant increase in sedimentation during urbanization may be anticipated, even with control under the grading ordinance, and increased sedimentation may be expected to continue because of the increased rates of flood discharge. The nutrient loading of streams is unlikely to be lessened with urbanization. It is not clear from analyses of nutrient discharge elsewhere in the Kaneohe region that the nutrient loading of the surface runoff would be significantly increased. However, the nutrient discharge to the Bay would be significantly increased if the sewage effluents were discharged to the Bay, even with tertiary treatment.

The Statement indicates that: "Continued practices of natural causes such as existing runoff and fresh water contamination will not improve the condition of the Bay and the reef ecosystems;" and that "Studies of Kaneohe Bay indicate

that unless conditions can revert back to the previous conditions of 1940-1950 the Bay can continue to deteriorate at a slow rate." As indicated above, continuation of existing runoff and fresh water contamination cannot be regarded as natural. Further, the most recent studies of the ecology of the southeastern part of the Bay have indicated that reversal of some of the post-1950 conditions has already begun, and further improvements may be expected when the sewage effluent diversion is accomplished. It would be regrettable if the conditions in the northwestern part of the Bay were allowed to deteriorate while the improvements were being effected in the southeastern part.

The Statement indicates that removal of the silt accumulated in the Bay could prove damaging because the release of "highly concentrated chemical nutrients and heavy metals based pesticides and herbicides." Removal of the silt might indeed prove damaging, simply because of the further sediment distribution that would result. Augmented nutrient release might also result, but aside from arsenic, which may perhaps have been used in the past, it seems unlikely that the sediments contain high concentrations of heavy metals, pesticides, or herbicides. In any case, the effects of disturbances of the sediments now deposited in the Bay have no pertinence to the effects of future urbanization in Waikane.

2. Flora and fauna

The Statement correctly indicates that the present flora and fauna of Waikane are for the most part introduced. It suggests that "improved practices of grading and shaping of the erosion-scarred hillsides and valley floor could improve the condition of the valley and also prove beneficial to the shoreline and coastal waters." However, the grading associated with urbanization is unlikely to result in improvement of erosion-scarred slopes, and no improvement of the valley floors can be anticipated from urbanization.

3. Water resources

The discussion of water resources in the Statement is valid so far as it goes. It does not recognize the development of surface and dike-water resources that has already occurred at the head of Waikane Valley, or the impacts of possible further development in the marginal dike zone. It also does not recognize the increased nutrient loadings that will result from the discharge of sewage subject to ordinary tertiary treatment. There is in the Statement no discussion of the effects of urbanization on the surface water hydrology of the valley to which reference had been made in our discussion of marine ecosystem effects.

4. Air quality

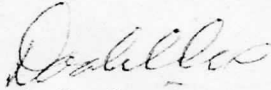
The Statement concludes that, with urbanization, the air quality in Waikane will remain in compliance with State standards except when period of high traffic density occur under certain meteorological conditions. It does not discuss these meteorological conditions, not indicate any analysis that would suggest how frequent or how great the exceedance of standards would be. It also does not indicate that any increase in air pollution would be in violation of the non-degradation policy of the State.

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5. Historical and archaeological sites

We have no evidence that the Statement comments on historical and archaeological sites are incorrect.

Yours very truly,


Doak C. Cox
Director